



National
Qualifications
2019

2019 Design and Manufacture

National 5

Finalised Marking Instructions

© Scottish Qualifications Authority 2019

These marking instructions have been prepared by examination teams for use by SQA appointed markers when marking external course assessments.

The information in this document may be reproduced in support of SQA qualifications only on a non-commercial basis. If it is reproduced, SQA must be clearly acknowledged as the source. If it is to be reproduced for any other purpose, written permission must be obtained from permissions@sqa.org.uk.



General marking principles for National 5 Design and Manufacture

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this paper. These principles must be read in conjunction with the specific marking instructions for each question. The marking schemes are written to assist in determining the 'minimal acceptable answer' rather than listing every possible correct and incorrect answer.

- (a) Marks for each candidate response must **always** be assigned in line with these general marking principles and the specific marking instructions for the relevant question.
- (b) Marking should always be positive, that is, marks should be awarded for what is correct and not deducted for errors or omissions.
- (c) If a candidate response does not seem to be covered by either the principles or specific marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (d) To be awarded marks candidates must respond to the command word used in the question. For example, listing a valid point, even if correct, should not be awarded marks if the question asked for an outline, description or explanation.
- (e) Mark consecutive responses to match the marks in 'name/state' questions. For example, if two responses are given to a 1 mark question, only the first response should be marked.
- (f) Candidates must answer all aspects of the question to gain full marks. For example, if the questions require two reasons candidates must make two valid and substantiated points relating to the question to gain both marks. If the questions require three stages to be described, candidates must provide a structure of characteristics and/or features of each of the three stages to be awarded all 3 marks.
- (g) For each candidate response, the following provides an overview of the marking principles. Refer to the specific marking instructions for further guidance on how these principles should be applied.
 - (i) Questions that ask candidates to **name/state/complete**
Candidates must provide the answer in brief form/name. Candidates will normally be required to make the same number of statements as marks available in the question.
 - (ii) Questions that ask candidates to **outline**
Candidates must provide a brief sketch of content. More than naming, but not a detailed description. Candidates will normally be required to make the same number of actual/appropriate points as marks available in the question.
 - (iii) Questions that ask candidates to **describe**
Candidates must provide a statement or structure of characteristics and/or features. This should be more than an outline or a list. Candidates may refer to, for instance, a concept, experiment, situation, or facts in the context of, and appropriate to, the question. Candidates will normally be required to make the same number of factual/appropriate points as marks available in the question.
 - (iv) Questions that ask candidates to **explain**
Candidates must generally relate cause and effect and/or make relationships between things clear. This will be related to the context of the question or a specific area within a question.

Marking instructions for each question

Section 1

Question			Expected response	Max mark	Additional guidance
1.	(a)	(i)	<p>Suitable hardwood.</p> <p>Name any one of the following</p> <ul style="list-style-type: none"> • beech • ash • oak. <p>Any other suitable response</p>	1	<p>1 mark for correct response.</p> <p>Hardwood identified must be light in colour to gain a mark.</p> <p>Mahogany, teak, walnut score zero marks.</p> <p>Maple, sycamore or birch scores one mark.</p> <p>Balsa, although light in colour is not suitable as it is not strong enough.</p>
		(ii)	<p>Additional material on the blank.</p> <p>A statement that covers two of the following</p> <ul style="list-style-type: none"> • allows for damage from the machine centres/chuck • allows for a margin of error • allows space for the tools to access the part • allows space for parting off • it is safer, so that turning doesn't need to take place close to lathe centres • allows two pegs to be made from the same blank. <p>Any other suitable response</p>	2	<p>1 mark for each correct reason up to a maximum of 2 marks.</p> <p>Exemplar responses</p> <p><i>'It makes it easier to turn'</i> scores zero marks.</p> <p>Unqualified <i>'quick'</i>, <i>'cheap'</i> or <i>'easy'</i> responses scores zero marks.</p> <p><i>'It makes it safer'</i> scores one mark.</p> <p><i>'The ends of the material will be damaged when on the wood lathe'</i> scores one mark.</p> <p><i>'Putting additional material at one end stops the fork centre damaging it. Putting additional material at the other end stops the revolving centre from damaging it'</i> scores one mark, as only refers to one bullet point.</p> <p><i>'The wood will get dented at each end by the lathe and so these bits need to be cut off. Also the bits between the parts are useful if you make a mistake'</i> scores two marks.</p>
		(iii)	<p>Wood lathe process</p> <ul style="list-style-type: none"> • parallel turning. 	1	<p>1 mark for correct response.</p> <p><i>'Step turning'</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
	(iv)	Check the diameters <ul style="list-style-type: none"> outside callipers. 	1	1 mark for correct response. Also accept micrometer, digital/vernier callipers, callipers or template. Steel rule, inside callipers or odd leg callipers scores zero marks.
(b)	(i)	Completing the sequence. <ul style="list-style-type: none"> marking gauge or mortise gauge cut groove jack/smoothing/block plane tenon saw, gent's saw, panel saw, back saw. Any other suitable response	4	1 mark for each correct response up to a maximum of 4 marks. 'Combination gauge' scores one mark. 'Groove' scores zero marks. 'Plane' scores one mark. 'Plough plane' scores zero marks. 'Saw' scores zero marks. 'Coping saw' and 'pad saw' score zero marks. 'Band saw' scores one mark. 'Mitre saw' scores one mark. Machinery such as 'fret saw/scroll saw' and 'circular saw' scores zero marks.
	(ii)	Why step 4 was before step 5. <ul style="list-style-type: none"> chamfering one piece is quicker/easier than doing four separate pieces the profile for all the sides will be the same. Any other suitable response	1	1 mark for correct response. Unqualified 'quick' or 'easy' responses scores zero marks.

Question		Expected response	Max mark	Additional guidance
	(iii)	<p>Checking frame is square</p> <ul style="list-style-type: none"> • measure diagonals • use a trammel • use a try square to check corners • use a template. <p>Any other suitable response</p>	2	<p>1 mark for each correct description up to a maximum of 2 marks.</p> <p>To be awarded full marks candidates must describe two methods.</p> <p>Exemplar responses</p> <p><i>‘Use an engineer’s square’/ ‘set square’/ ‘combination square’</i> scores one mark.</p> <p><i>‘Use a try square.’</i> scores one mark.</p> <p><i>‘Use a ruler’</i> scores zero marks.</p> <p><i>‘Measure it’</i> scores zero marks.</p> <p><i>‘Measure the diagonals and check they match’</i> scores one mark.</p> <p><i>‘Check the diagonals are the same size using a piece of wood/string (trammel)’</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
(c)	(i)	<p>MDF benefits.</p> <p>A statement that includes two of the following</p> <ul style="list-style-type: none"> • cheaper than solid timber • easy to work with/drill • available in wide boards • does not warp or twist • smooth surface for good quality finish • suitable strength for the back board • easy to source/readily available • thin sheets of MDF are lightweight and easy to manoeuvre • Made from recycled materials • MDF has suitable durability. <p>Any other suitable response</p>	2	<p>1 mark for each correct explanation.</p> <p>Unqualified '<i>cheap</i>' and '<i>easy</i>' responses are insufficient to gain a mark but subsequent responses could still gain a mark.</p> <p>Exemplar responses</p> <p><i>'Easy to work with'</i> scores one mark.</p> <p><i>'Easy to use'</i> scores zero marks. This response is too vague.</p> <p><i>'It is smooth.'</i> scores one mark. Relevant to the surface finish.</p> <p><i>'It is strong'</i> scores one mark. (The backboard needs to support the pegs.)</p> <p><i>'MDF is available in large sheets which is ideal for the back board. Also the surface is smooth and so it will look good when painted'</i> scores two marks.</p> <p><i>'It doesn't warp like wood and it is easy to use'</i> scores one mark.</p> <p><i>'Easy to use'</i> scores zero marks as it is unqualified.</p> <p><i>'Drilling the MDF will be easier than drilling a board with wood knots. It also costs less than buying pine'</i> scores two marks.</p>
	(ii)	<p>Pillar drill safety.</p> <p>A statement that includes two of the following</p> <ul style="list-style-type: none"> • the chuck key is removed before use • the drill bit is secure • the guard is down • the wood is secure/clamped • the table is secure on the drill • check speed. <p>Any other suitable response</p>	2	<p>1 mark for correct response.</p> <p>Responses must refer to the pillar drill before use, not the user. This is a state question so mark the first two responses given.</p> <p>Exemplar responses</p> <p><i>'You must wear goggles'</i> scores zero.</p> <p><i>'The guard'</i> scores zero marks.</p> <p><i>'Put the guard down before use'</i> scores one mark.</p> <p><i>'Put the guard down before use and make sure the wood is secure'</i> scores two marks.</p>

Question	Expected response	Max mark	Additional guidance
	<p>(iii) High quality paint finish.</p> <p>A description that includes one of the following</p> <ul style="list-style-type: none"> • sand/abrade surfaces • seal MDF/use PVA as a primer • apply layers of paint • rub down with sandpaper between coats • remove dust • ensure the brush is not overloaded with paint • wait for the paint to dry between coats • brush in one direction • remove any drips or runs • remove any bristles/fibres/specks that come off the brush/roller/sponge • spray at the correct distance • dust free environment • apply a protective/aesthetic top coat such as varnish • ensure even coverage. <p>Any other suitable response</p>	3	<p>1 mark for each correct description up to a maximum of 3 marks.</p> <p>Responses do not solely have to refer to application of paint to gain marks.</p> <p>Exemplar responses</p> <p><i>‘Apply thin layers’</i> scores one mark.</p> <p><i>‘Use a roller/sponge’</i> scores one mark.</p> <p><i>‘Pick off any stray bristles and fix paint runs on the edges before the paint dries’</i> scores two marks.</p> <p><i>‘Use a brush to cover the board with a thin layer of paint. Leave to dry and lightly sand it before applying another layer’</i> scores three marks.</p> <p><i>‘Rub out pencil marks’</i> scores zero marks.</p> <p><i>‘Stir the paint/shake the can’</i> scores one mark.</p>
	<p>(d) Fold in plastic.</p> <p>A description could include any two responses from the following stages</p> <p>Heating stage</p> <ul style="list-style-type: none"> • heat it with the strip heater/line bender • soften it with the strip heater. <p>Folding stage (no reference to tool necessary for this stage)</p> <ul style="list-style-type: none"> • fold it into required shape/bend it around a former. <p>Setting stage</p> <ul style="list-style-type: none"> • leave in vice to cool • leave under a weight/heavy object • hold in place until it sets. <p>Any other suitable response</p>	2	<p>1 mark for each correct description up to a maximum of 2 marks.</p> <p>Exemplar responses</p> <p><i>‘Bend it on the strip heater’</i> scores zero marks.</p> <p><i>‘Bend it on the line bender’</i> scores one mark.</p> <p><i>‘Bend it’</i> scores zero marks.</p> <p><i>‘Bend it to the required shape’</i> scores one mark.</p> <p>Candidates can gain a mark by showing an understanding across a number of stages.</p>

Question		Expected response	Max mark	Additional guidance
(e)	(i)	<p>Copper suitability.</p> <p>A statement that includes two of the following</p> <ul style="list-style-type: none"> • easy to shape/form • attractive • malleable/ductile • strong enough to support the phone • polishes to a high shine • does not rust/non-ferrous • easy to source • comes in flat sheets. <p>Any other suitable response</p>	2	<p>1 mark for each correct reason up to a maximum of 2 marks.</p> <p>Reference to cold forming can attract a mark.</p> <p>Exemplar responses</p> <p><i>‘Easy to work with’</i> scores one mark.</p> <p><i>‘Easy to use’</i> scores zero marks. This response is too vague.</p> <p><i>‘Strong’</i> scores one mark. (Has to support the phone.)</p> <p>Durability isn’t a relevant property for the phone shelf, so read on.</p> <p><i>‘There is no need to heat the copper to bend it’</i> scores one mark.</p> <p><i>‘The colour of the copper stands out against the backboard’</i> scores one mark.</p> <p>References to dip coating/painting score zero marks.</p> <p><i>‘It is orangey brown’</i> scores zero marks.</p>

Question	Expected response	Max mark	Additional guidance
	<p>(ii) Marking out.</p> <p>A description that includes three of the following</p> <ul style="list-style-type: none"> • set odd-leg callipers to correct size using metric rule • mark lines for centre using odd-leg callipers • use a template • centre punch the middle of the crosses • draw lines at 90° with an Engineer's square • draw lines with a scribe • mark the arcs with dividers. <p>Any other suitable response</p>	<p>3</p>	<p>1 mark for each correct description up to a maximum of 3 marks.</p> <p>A list of tools scores zero marks.</p> <p>Exemplar responses</p> <p><i>'A steel rule can be used to measure the sizes'</i> scores one mark.</p> <p><i>'A scribe to mark the lines'</i> scores one mark.</p> <p><i>'Mark the lines with an Engineer's square'</i> scores one mark.</p> <p><i>'Mark the lines with an Engineer's square and scribe'</i> scores two marks.</p> <p><i>'Use a template to mark the shape'</i> scores one mark.</p> <p><i>'First put on the measurements using a steel rule and mark on the lines with a scribe. Punch the centre of the cross to make a dent that stops the dividers slipping'</i> scores three marks.</p> <p><i>'Using odd leg callipers mark the centre lines. Draw the curves with dividers'</i> scores two marks.</p> <p>References to a compass scores zero.</p> <p>Sketches may attract marks independently.</p>

Question	Expected response	Max mark	Additional guidance
	<p>(iii) Rounded corners.</p> <p>A description that covers two of the following</p> <p>Cutting</p> <ul style="list-style-type: none"> • support the metal using an engineer’s vice/bending bars • cut roughly to shape using tin snips/junior hacksaw/hacksaw/coping saw/abrafile. <p>Shaping</p> <ul style="list-style-type: none"> • create curve using file • remove burr with emery cloth. 	2	<p>1 mark for a correct response.</p> <p>References to the ‘guillotine’/’notcher’ could attract marks.</p> <p>Candidates can score two marks by referring only to the cutting or shaping stage.</p> <p>Laser cutter/plasma cutter and water-jet cutter scores zero as these are not manual workshop tools.</p> <p><i>‘Cut corner using cold chisel’</i> scores one mark.</p> <p>A basic list of tools scores zero marks.</p> <p>Exemplar responses</p> <p><i>‘Tin snip it to shape, before smoothing it out’</i> scores one mark.</p> <p><i>‘Use a curved motion with the flat file’</i> scores one mark.</p> <p><i>‘Roughly cut off most of the waste with a junior hacksaw then shape it more accurately with a file’</i> scores two marks.</p>
	<p>(iv) Fold the copper.</p> <p>A description that covers two of the following</p> <ul style="list-style-type: none"> • secure in vice/bending bars/box folder • form bends using mallet • raise the handle (of box folder) • press copper sheet with a block of wood to create sharp bend • use of a jig/former. <p>Any other suitable response</p>	2	<p>1 mark for each correct description up to a maximum of 2 marks.</p> <p>Exemplar response</p> <p><i>‘Bend the metal around a wooden former using a hammer’</i> scores one mark. (Mark not awarded for <i>hammer</i> as this would dent the copper.)</p> <p>References to ‘heating’/’annealing’ the copper scores zero marks.</p> <p>Box folder can be referred to as ‘GABRO’ or ‘bending machine’ etc.</p>

Question			Expected response	Max mark	Additional guidance
2.	(a)	(i)	<p>A description that refers to three of the following stages</p> <ul style="list-style-type: none"> • decide on the questions to be used • identify the target audience • test/check the questionnaire for example length/clarity • ask questions/distribute the questionnaire • collect results • analyse results. <p>Any other suitable response</p>	3	<p>1 mark for each valid description up to a maximum of 3 marks.</p> <p>Reference to the toaster is not necessary.</p> <p>Some interpretation may be required from the marker with reference to the bullet points on the left.</p> <p>Typical response</p> <p>‘Hand out questionnaire to target audience’ scores two marks.</p> <p>‘Hand out questionnaire’ scores one mark.</p> <p><i>‘Don’t make it too long as people may get bored’</i> scores one mark.</p> <p>A list of questions can be interpreted as generating a questionnaire.</p>
		(ii)	<p>Alternative research technique</p> <ul style="list-style-type: none"> • user trips. <p>Any other suitable response</p>	1	<p>1 mark for the correct response.</p> <p>Candidates may also refer to</p> <ul style="list-style-type: none"> • user trials • testing/test rigs • comparisons • reviews. <p><i>‘Use the internet’</i> unqualified so scores zero marks.</p> <p><i>‘Survey’</i> is considered too similar to questionnaire so scores zero marks.</p> <p><i>‘Market research’</i> scores zero marks.</p>

Question		Expected response	Max mark	Additional guidance
	(b)	<p>Explanation could reference the following</p> <ul style="list-style-type: none"> • gives a clear idea of what the product should be • to help explore and refine ideas • the designer is less likely to forget to incorporate important features • it can be used to evaluate the suitability of a product. <p>Descriptions may reference the toaster.</p> <p>Any other suitable response</p>	1	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>Reference to the toaster is not necessary.</p> <p>Example responses <i>'As a checklist for your design'</i> scores one mark.</p> <p><i>'As a starting point'</i> scores zero marks.</p> <p><i>'Research on the size of the bread, detailed in the specification will help determine the size of the slots'</i> scores one mark.</p> <p><i>'Ergonomic specifications will help determine the size of the buttons/levers'</i> scores one mark.</p>
	(c)	<p>Description of the key stages of brainstorming that includes any three of the following</p> <p>Typical responses for brainstorming could include reference to</p> <ul style="list-style-type: none"> • communicate the purpose of the activity • group activity • coming up with lots of ideas within a designated time • record all ideas • no ideas too silly • spark ideas off of each other <p>Any other suitable response.</p>	3	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 3 marks.</p> <p>Candidates do not need to refer to all three stages to gain full marks.</p> <p><i>'People shout out lots of ideas and someone writes them down'</i> scores two marks.</p> <p><i>'Think of lots of ideas'</i> scores zero marks. This response is too vague.</p> <p><i>'People think of lots of ideas'</i> scores one mark (refers to group).</p>

Question		Expected response	Max mark	Additional guidance
3.	(a)	<p>In the context of this question an unqualified 'quick' is accepted.</p> <p>Statements including any of the following</p> <ul style="list-style-type: none"> • sketches can be produced quickly which allows lots of ideas to be produced in a short time • communicates your idea visually • sketches can be used to explore/evolve • you are not limited or constrained by computer software • if mistakes are made they can be easily changed or discarded • you do not need any specific information, ideas can emerge naturally • no specialist equipment is required. <p>Any other suitable response</p>	2	<p>To be awarded marks candidates must provide an explanation when answering this question.</p> <p>1 mark for each valid point leading to a clear explanation, up to a maximum of 2 marks.</p> <p>Unqualified 'easy' responses scores zero marks.</p> <p>In the context of this question an unqualified 'quick' is accepted.</p> <p>Example responses</p> <p><i>'To see how it is put together'</i> scores one mark.</p> <p>References to parts of the given graphic can be matched to <i>'communicates your idea visually.'</i></p> <p><i>'Gives a rough idea of what it will look like'</i> scores one mark.</p> <p><i>'Easy to change'</i> scores one mark.</p>
	(b)	<p>Statements could show</p> <ul style="list-style-type: none"> • dimensions • exploded/assembly drawing showing how parts join together • part names/number of parts • materials • orthographic views of product • scaled up details. <p>Any other suitable response</p>	2	<p>1 mark for each valid point, up to a maximum of 2 marks.</p> <p>Example responses</p> <p><i>'To allow manufacture'</i> scores one mark.</p> <p><i>'To see how it works/functions/looks like'</i> scores zero marks. This response is too vague.</p> <p><i>'To show the client'</i> scores zero marks.</p>

Question	Expected response	Max mark	Additional guidance
4.	<p>Explanation including any of the following general reasons</p> <ul style="list-style-type: none"> • provides better understanding of 3D form • to help generate ideas • to refine ideas • to communicate with the client • to check/test the design before production • can be altered and refined as feedback is gained • cheaper than making the product repeatedly. <p>Candidates would have to refer specifically to computer-generated models to gain marks for</p> <ul style="list-style-type: none"> • very accurate • improves presentation as different views and versions can be created once the original model has been created • realistic representation of materials and textures will improve communication with client • long term economic benefit • easy to edit/change • can send/share electronically • ease of storage • easy to export to CAM/CNC/rapid prototyping. <p>Any other suitable response</p>	3	<p>1 mark per correct response up to a total of 3 marks.</p> <p>Candidates may refer to physical or computer-generated models.</p> <p>Multiple references to testing or refining design factors may gain multiple marks.</p> <p>Example responses</p> <p><i>'To check it'</i> scores zero marks. This response is too vague.</p> <p><i>'To check the sizes'</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
5.	(a)	<p>Descriptions must reference how ergonomics may have influenced the iron or ironing board.</p> <p>Typical responses could include reference to</p> <p>Anthropometrics</p> <ul style="list-style-type: none"> any one iron/ironing board part linked to one piece of appropriate anthropometric information adjustable ironing board height – waist/elbow height length of table – arm length/ reach distance between ironing board feet – breadth of human feet/stance shape/size of table top – considers size of clothing ∅ of handle – grip ∅ handle length – palm width button location – thumb length. <p>Physiology</p> <ul style="list-style-type: none"> strength required to raise/lower/adjust board, erect/fold board, lift/carry board, pull adjusting levers strength required to lift/move the iron how hard you need to press the button comfort of handle easy to fill. <p>Psychology</p> <ul style="list-style-type: none"> colour of parts to provide visual information sound when iron is at correct temperature easy to understand control features. <p>Any other suitable response</p>	4	<p>1 mark for each correct response up to a total of 4 marks.</p> <p>Different answers must be given in parts (a), (b) and (c).</p> <p>If candidates mix-up the different elements of ergonomics they can still gain marks.</p> <p>To gain marks, candidates should describe the relationship between the anthropometric consideration and all, or a part of, the ironing board.</p> <p>No marks for noting percentiles only, for example, ‘95th percentile’ on its own scores zero marks.</p> <p>Candidates can still gain marks if they mix up percentiles, for example, ‘50th percentile palm width size to length of iron handle’ scores one mark.</p> <p>A list of iron/ironing board parts scores zero marks.</p> <p>No marks should be awarded for generic statements about anthropometrics.</p> <p>Example responses</p> <p><i>‘The blue cover of the ironing board makes it look attractive’</i> scores zero marks.</p> <p><i>‘The blue cover of the ironing board makes it feel calming’</i> scores zero marks.</p> <p><i>‘The blue part on the iron shows where the water is stored’</i> scores one mark.</p> <p><i>‘The height of the ironing board for the height of a person’</i>, scores zero marks.</p>

Question	Expected response	Max mark	Additional guidance
(b)	<p>Descriptions must reference how function may have influenced the iron/ironing board.</p> <p>Typical responses could include reference to</p> <ul style="list-style-type: none"> • iron board correct size to fit clothes • rack to hold clothes • rack to hold iron • cover should be heat resistant • legs are foldable for storage • top is adjustable in height • iron has adjustable heat • iron has water container • iron produces steam • button sprays steam/water • iron has long cable to reach either end of board • smooth heat plate so iron glides • holes in sole plate to allow steam out <p>Any other suitable response</p>	2	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>To gain marks, candidates should describe the relationship between the functional consideration and all, or a part of, the iron or the ironing board.</p> <p>Different answers must be given in parts (a), (b) and (c).</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 2 marks.</p> <p>Physiological responses need to be related to function to gain marks.</p> <p><i>‘Strength required to move the dial’</i> scores zero marks.</p> <p><i>‘Strength required to move the dial to adjust the heat’</i> scores one mark.</p> <p><i>‘There needs to be different temperature settings for different fabrics’</i> scores one mark.</p> <p><i>‘There needs to be an obvious filling point, so that it is easy to add the water’</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
	(c)	<p>Descriptions must reference how safety may have influenced the iron/ironing board.</p> <p>Typical responses could include reference to</p> <ul style="list-style-type: none"> • the heat plate is a different colour to stand out from the rest of the iron • stability provided by wide base • insulation provided by plastic • distance from sole plate to handle • strength required to raise/lower/adjust board, erect/fold board, lift/carry board, pull adjusting levers • folding mechanism designed to minimise finger traps • no sharp edges • red light to indicate danger when iron is on • hygiene issues – smooth surfaces easy to clean • hygiene issue – removable cover, easy to clean. <p>Any other suitable response.</p>	2	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>Different answers must be given in parts (a), (b) and (c).</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 2 marks.</p> <p><i>‘Strong enough to support the weight of the iron’</i> scores zero marks.</p> <p><i>‘Strong enough to take the pressure of someone ironing’</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
6.	(a)	<p>A description that includes three of the following broad areas of aesthetics</p> <ul style="list-style-type: none"> • colour • shape/form • texture • proportion • symmetry • materials • fashion • contrast • pattern. <p>Any other suitable response</p>	3	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 3 marks.</p> <p>To gain one mark candidates should refer to one of the broad areas and link it to a part, or parts, of the speaker.</p> <p>Marks are not awarded for the influence of aesthetics.</p> <p>A list of aesthetic terms scores zero marks.</p> <p>Example responses</p> <p><i>'The speaker is blue'</i> scores one mark.</p> <p><i>'The red and blue colours contrast'</i> scores two marks. (Contrast descriptions always refer to another aesthetic aspect.)</p> <p><i>'It has a curvy shape'</i> scores one mark.</p> <p><i>'The colours are eye-catching'</i> scores one mark.</p> <p><i>'The red colour is eye-catching'</i> scores one mark.</p> <p>'Eye-catching' on its own scores zero marks.</p> <p><i>'The red colour is eye-catching which will increase sales'</i> scores one mark. (No extra marks for influence.)</p> <p>With reference to the shape, vague responses such as <i>'different'</i>, <i>'nice'</i>, <i>'interesting'</i> or <i>'unusual'</i> scores zero marks.</p> <p>Responses such as <i>'unique'</i>, <i>'abstract'</i>, <i>'organic'</i> scores one.</p> <p>If only one area of aesthetics is referenced twice, max 1 mark.</p>

Question		Expected response	Max mark	Additional guidance
	(b)	<p>Explanation including two of the following</p> <ul style="list-style-type: none"> • trust in a brand name/reputation • guaranteed sales for manufacturer • self-promoting/advertising • premium pricing • customer loyalty • perception of a high-quality product. <p>Any other suitable response</p>	2	<p>To be awarded marks candidates must provide an explanation when answering this question.</p> <p>1 mark for each valid point leading to a clear explanation, up to a maximum of 2 marks.</p> <p>Example response</p> <p><i>‘Well known so people are more likely to buy it’</i> scores one mark.</p> <p><i>‘If customers believe the brand produces high quality products then they are more likely to purchase an additional product produced by the same brand’</i> scores one mark.</p>
	(c)	<p>Marketing techniques could reference the following</p> <ul style="list-style-type: none"> • adverts, for example, TV, radio, billboard posters/leaflets • websites/social media/apps • celebrity endorsement • free gifts/prizes • emphasise brand name, target same market • special offer/low initial price • prominent location in stores • sell under a recognised brand name • try before you buy. <p>Any other suitable response</p>	2	<p>1 mark for each correct response up to a maximum of 2 marks.</p>

Section 2

Question			Expected response	Max mark	Additional guidance
7.	(a)	(i)	<p>Iron.</p> <p>Typical explanations are likely to include reference to</p> <ul style="list-style-type: none"> weight properties durability suitable for casting readily available. <p>Any other suitable response</p>	2	<p>1 mark for naming the correct material, 1 mark for correct explanation.</p> <p>Different answers/reasons must be given in parts (a)(i) and (a)(ii).</p> <p>To be awarded the second mark candidates must provide an explanation when answering this question.</p> <p>Example explanations</p> <p><i>'Iron has a relatively low melting point and so is suitable for casting the weight plate'</i> scores one mark.</p> <p><i>'It is heavy'</i> scores one mark.</p>
		(ii)	<p>Mild steel.</p> <p>Typical explanations are likely to include reference to</p> <ul style="list-style-type: none"> strength properties durability easy to paint easy to shape readily available. <p>Any other suitable response</p>	2	<p>1 mark for naming the correct material, 1 mark for correct explanation.</p> <p>Different answers/reasons must be given in parts (a)(i) and (a)(ii).</p> <p>To be awarded the second mark candidates must provide an explanation when answering this question.</p> <p>Example explanations</p> <p><i>'It is strong'</i> scores one mark.</p> <p><i>'Mild steel is strong enough to support the weights'</i> scores one mark.</p>
	(b)		<p>Descriptions including any two of the following</p> <ul style="list-style-type: none"> rough surface texture one-piece construction tapered sides split lines fillets/rounded corners fettle marks due to removal of runners/risers/split lines. <p>Any other suitable response</p>	2	<p>1 mark for each correct statement up to a maximum of 2 marks.</p> <p>Example explanations</p> <p><i>'It is rough'</i> scores one mark.</p> <p>Reference to 'sprue marks' scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
	(c)	<p>Explanations including any two of the following</p> <ul style="list-style-type: none"> • fully automated • accuracy • consistency of product • high quality of finish • quicker than sand casting • mould can be reused • suitable for mass production • complexity of shape/thread. <p>Any other suitable response</p>	2	<p>1 mark for each correct statement up to a maximum of 2 marks.</p> <p>Unqualified '<i>quick</i>', '<i>cheap</i>' or '<i>easy</i>' responses scores zero marks.</p>
	(d)	<p>Rotational moulding.</p> <p>Typical explanations are likely to include reference to</p> <ul style="list-style-type: none"> • hollow • closed shape • faster than injection moulding two parts • good surface finish • little wastage • surface detail. <p>Any other suitable response</p>	2	<p>1 mark for naming the correct process, 1 mark for correct explanation.</p> <p>Example explanation</p> <p><i>'Provides a hollow shape, this will allow the weight to be filled with concrete'</i> scores one mark.</p>
8.	(a)	<p>A description that includes three of the following</p> <ul style="list-style-type: none"> • products are cheaper so more accessible to buy • a larger range of products available • products are more readily available/meets consumer demand • quality assurance • reduction in jobs • economic decline of area • skilled workers required for higher level roles • less labour intensive jobs • some workers becoming deskilled • loss of manufacturing knowledge in industry • reduction in work related injuries. <p>Any other suitable response</p>	3	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 3 marks.</p> <p>Responses must be linked to society to gain marks.</p> <p>Suitably linked environmental responses can gain marks.</p> <p>Example answer</p> <p><i>'The increase of automation in mass manufacture has led to a reduction in the number of workers required and so has meant workers are becoming deskilled'</i> scores two marks.</p> <p><i>'More people can afford to buy it'</i> scores one mark.</p>

Question		Expected response	Max mark	Additional guidance
	(b)	<p>An explanation that includes one of the following</p> <ul style="list-style-type: none"> • require skilled craftsmen • require specialist equipment • bespoke • low volume of product needed. <p>Any other suitable response</p>	1	<p>1 mark for correct response.</p> <p>Answers referring to ‘intricate’ or ‘delicate’ score zero marks.</p>
9.		<p>An outline that includes two of the following</p> <ul style="list-style-type: none"> • produced in standard sizes so easy to incorporate into designs • reduces the need for a skilled workforce • cheaper than producing yourself • can be used on different products • quality assured by producer • easy to repair/maintain • available in large quantities/easy to source • will fit common tools • can transfer across different products • don’t have to manufacture them yourself • fewer stages in production • accurate/exactly the same. <p>Any other suitable response</p>	2	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 2 marks.</p> <p>Unqualified ‘<i>quick</i>’, ‘<i>cheap</i>’ or ‘<i>easy</i>’ responses scores zero marks.</p>

Question	Expected response	Max mark	Additional guidance
10.	<p>An outline that includes four of the following</p> <ul style="list-style-type: none"> • renewable energy sources • make manufacturing more energy efficient • sustainable materials • recyclable materials • locally sourced materials/reduce transport • reduce packaging • reduce the amount of material used • lifespan of materials and standard components • ease of maintenance • minimise waste material • recycle materials • reduce the component parts • reduce number of processes • reduce factory emissions • limit the amount of product being produced • impact on habitat. <p>Any other suitable response</p>	4	<p>To be awarded marks candidates must provide a description when answering this question.</p> <p>1 mark for each valid point leading to a clear description, up to a maximum of 4 marks.</p> <p>Example answers</p> <p><i>‘Manufacturers could use locally sourced materials so that there is less pollution caused transporting the materials to the factory’</i> scores one mark.</p> <p><i>‘The manufacturer could use recycled materials to make the product. They could use less packaging meaning less cardboard and therefore saving on trees being cut down. With less packaging they could get more in a lorry saving on transport and pollution from lorries. The product could be labelled so it can be recycled at the end of its use.’</i> 4 marks</p>

[END OF MARKING INSTRUCTIONS]